

3202

BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL - 2019
DIPLOMA IN AUTOMOBILE ENGINEERING
ENGINEERING MATHEMATICS II
THIRD SEMESTER EXAMINATION

Time: 3 Hours**Total Marks: 80****PART - A (10 x 3 = 30 Marks)***Note 1: Answer all questions and each question carries 3 marks**2: Answers should be brief and straight to the point and shall not exceed 5 simple sentences*

1. Evaluate $\int \frac{[1 + \log x]^5}{x} dx$

2. Evaluate $\int \left(x^2 + \frac{1}{x^2}\right)^2 dx$

3. Evaluate $\int \frac{dx}{\sqrt{3+2x^2}}$

4. Evaluate $\int \frac{x+1}{(3x^2+6x+5)^{10}} dx$

5. Evaluate $\int x \sin x dx$

6. Evaluate $\int_{-1}^1 e^{2x+3} dx$

7. Find the area bounded by the $y^2 = 4x$ curve the x-axis and the line $x = 3$.

8. Solve $(D^2 + 4D + 7)y = 0$

9. Solve $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$

* 10. Form the differential Equation of family of curves $y = Ae^{2x} + Be^{-2x}$ Where A, B are arbitrary constants.

PART - B (5 x 10 = 50 Marks)*Note 1: Answer any five questions and each question carries 10 marks**2: The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer*

11. i. Evaluate $\int \cos 7x \cos 2x dx$ ii. Evaluate $\int \sin^3 x \cdot \cos^6 x dx$

12. i. Evaluate $\int \frac{1}{1-3x+x^2} dx$ ii. Evaluate $\int \frac{1}{5-3\cos x} dx$

13. Find the area enclosed between the curve $y = x^2$ and the line $y = 3x+4$.

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14. (a). Find the volume of the solid obtained by revolving the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ About x - axis
 (b). Find the RMS value of $\sqrt{\log x}$ between $x = e$ and $x = e^2$.
15. Solve $(x^2 - y^2) dx + 2xy dy = 0$
16. A. Solve $(D^2 + 1)y = \cos x \sin 3x$ B. Solve $(D^2 - 3D + 2)y = x$
17. A. Solve $(1 + x^2) \frac{dy}{dx} + 2xy = x^3$
 B. Solve $(D^2 + 1)y = e^{-x}$
- 18A. Evaluate $\int_0^1 x^2 dx$ approximately by dividing the interval $[0,1]$ into 10 sub – intervals using Trapezoidal rule.
 B. Solve $(y \cos x + \sin y + y) dx + (\sin x + x \cos y + x) dy = 0$

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